

1 What is claimed is:

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3 1. A method of producing organic polymer nanofibers having a
4 reaction to chemical vapors, the method comprising the steps
5 of,

6 forming a catalysis solution comprising an acid and an
7 oxidizer,

8 forming a monomer solution comprising a monomer and an
9 organic solvent, and

10 disposing the catalysis solution upon the monomer solution
11 for forming an aqueous and organic interfacial interface
12 between the catalysis solution upon the monomer solution for
13 generating the organic polymer nanofibers.

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16 2. The method of claim 1 wherein,

17 the monomer is selected from the group consisting of
18 aniline, pyrrole, thiophene, toluidine, anisidine and other
19 derivatives of aniline such as methylaniline, ethylaniline, 2-
20 alkoxyaniline, and 2,5 dialkoxyaniline for respectively
21 producing polyaniline nanofibers, polypyrrole nanofibers,
22 polythiophene nanofibers, polytoluidine nanofibers,
23 polyanisidine nanofibers, polymethylaniline nanofibers,
24 polyethylaniline nanofibers, poly2-alkoxyanilines nanofibers
25 and poly2,5-dialkoxyanilines) nanofibers respectively.

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1 3. The method of claim 1 wherein,

2 the acid is selected from the group consisting of
3 hydrochloric acid, sulfuric acid, nitric acid, perchloric acid,
4 phosphoric acid, acetic acid, formic acid, tartaric acid,
5 methanesulfonic acid, ethylsulfonic acid, 4-toluenesulfonic
6 acid and camphorsulfonic acid.

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8 4. The method of claim 1 wherein,

9 the oxidizer is selected from the group consisting of
10 ammonium peroxydisulfate, iron chloride and other
11 peroxydisulfate derivates such as sodium peroxydisulfate and
12 potassium peroxydisulfate.

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14 5. The method of claim 1 wherein,

15 the organic solvent is selected from the group consisting of
16 carbon tetrachloride, benzene, toluene, chloroform, methylene
17 chloride, xylene, hexane, diethylether, dichloromethane and
18 carbon disulfide.

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20 6. The method of claim 1 wherein,

21 the chemical vapor is selected from the group consisting of
22 acid vapors, basic vapors, and alcohols.

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24 7. The method of claim 1 wherein,

25 the chemical vapor is selected from the group consisting of
26 acidic vapors, basic vapors, alcohols, volatile organic
27 chemicals, oxidizing agents and reducing agents.

1 8. The method of claim 1 wherein,

2 the reaction is selected from the group consisting of a
3 conductivity reaction, an optical reaction, a conformation
4 reaction, a density reaction, an oxidation reaction and a
5 reduction reaction.

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7 9. The method of claim 1 wherein the catalysis solution becomes
8 a polymer solution comprising the polymer nanofiber, and the
9 monomer solution becomes an organic solution depleted of the
10 monomer, the method further comprising the steps of,

11 separating the polymer solution from the organic solution,
12 purifying the polymer solution for extracting the polymer
13 nanofibers from the polymer solution.

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15 10. The method of claim 1 further comprising the steps of,
16 forming a thiol surface layer on gold terminals,
17 forming a precoating of the polymer nanofibers upon the gold
18 terminals.

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20 11. The method of claim 1 further comprising the step of,
21 selecting the acid for providing a predetermined sized
22 diameter of the polymer nanofibers.

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24 12. The method of claim 1 wherein,
25 the polymer nanofibers have diameters less than 500 nm and
26 lengths less than 10 μm .

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1 13. The method of claim 1 wherein,

2 the polymer nanofibers are polyaniline nanofibers having
3 diameters less than 500 nm and lengths less than 10 μ m.

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5 14. A method of producing an organic conducting polymer
6 nanofibers having a reaction to chemical vapors, the method
7 comprising the steps of,

8 forming a catalysis solution comprising an acid and an
9 oxidizer,

10 forming a monomer solution comprising a monomer and an
11 organic solvent, and

12 disposing the catalysis solution upon the monomer solution
13 for forming an aqueous and organic interfacial interface
14 between the catalysis solution upon the monomer solution for
15 generating the conductive organic polymer nanofibers.

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1 15. The method of claim 14 wherein,

2 the monomer is selected from the group consisting of
3 aniline, pyrrole, and thiophene for respectively producing
4 polyaniline nanofibers, polypyrrole nanofibers, and
5 polythiophene nanofibers, respectively,

6 the acid is selected from the group consisting of
7 hydrochloric acid, sulfuric acid, nitric acid, perchloric acid,
8 and camphorsulfonic acid,

9 the oxidizer is selected from the group consisting of
10 ammonium peroxydisulfate, iron chloride, sodium peroxydisulfate
11 and potassium peroxydisulfate,

12 organic solvent is selected from the group consisting of
13 carbon tetrachloride, benzene, toluene, chloroform, methylene
14 chloride, xylene, hexane, diethylether, dichloromethane and
15 carbon disulfide,

16 the chemical vapor is selected from the group consisting
17 of acidic vapors, basic vapors, water, alcohols, organic vapors
18 and reducing agents,

19 the reaction is change in conductivity reaction.
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21 16. The method of claim 15 wherein,

22 the acid is camphorsulfonic acid, and

23 the diameters of the nanofibers are 50 nm.
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25 17. The method of claim 15 wherein,

26 the acid is hydrochloric acid, and

27 the diameters of the nanofibers are 30 nm.
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1 18. The method of claim 15 wherein,
2 the acid is perchloric acid, and
3 the diameters of the nanofibers are 120 nm.
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